ISSN NO: 2770-4491
Date of Publication:28-05-2022

Tendencies of the Study of Machine-Mechanism Theory

Rakhimova Ikhlas Rakhmatovna
Urgench State University
Lecturer at the Department of Interfaculty General Technical Sciences

Annotation: This article discusses the importance of studying the theory of machines and mechanisms, the specifics of the study of the field, the aspects that need attention and some concepts.

Key words: Machinery, mechanics, dynamics, manipulator, prosthesis, rishag, etc.

INTRODUCTION:

The theory of machines and mechanisms is the study of the mechanics of various machines and mechanisms, the methods of kinematic and dynamic analysis and design (synthesis). This science is an introduction to the future engineering profession, so it has an engineering direction, in which modern mathematical apparatus is widely used and practical ways to solve the above problems in a graphical, graph-analytical and computer-assisted analytical way. Deep study of the basics of each science, teaching students to see the future development through a scientific eye will lead to the rapid development of society. A more important question than what should be the technology of the future, what kind of inter-industry machine should be invented, designed and built, is probably not in modern science and technology. The well-being of our country, its confidence in the future depends in many respects on the correct solution of these issues. In modern technology, many issues that need to be addressed have not been resolved.

LITERATURE REVIEW:

In order to properly address such complex issues, it is necessary to direct the minds of thousands of scientists, professors, teachers, engineers and designers. In this regard, it is very important to see the future scientifically, to clarify the boundaries of technical progress. The development of the future is inconceivable without a scientifically based technique, that is, a mechanism and a machine, so it is necessary to pay more attention to the science that teaches the scientific basis of the machine and the mechanism.

The purpose of the subject "Theory of Machines and Mechanisms" is to provide students with the necessary knowledge to study and design the most optimal schemes and parameters of mechanisms that meet the requirements of practice for the creation of modern machines, devices, instruments, automatic systems and complexes. The main task of science is to develop the various machines and devices used in the national economy. Introducing the secret.

RESEARCH METHODOLOGY:

The machines created can control the production and other processes on the basis of pre-configured programs, and in some cases it is possible to completely free man from this process. If necessary, the machine can replace some human organs. . For example; Manipulators, prostheses, artificial organs and more.

In the design of mechanisms used in industrial machines, their structure, ie the number of moving joints and methods of their interaction, the formation of the mechanism and the transfer of motion from the drive joint to the drive joints you need to know the order clearly.

The movement of one or more bodies to the beneficial motion of another body

The system of rotating bodies is called a mechanism.

The mechanism consists of nine joints and kinematic pairs. A solid that is part of a mechanism is called a joint.

The joints are connected to each other by kinematic pairs. Fixed joints are called supports.

Excited joints are divided into entrance, exit and intermediate joints.

The input unit receives motion from the engine, and the output unit is connected to the working body of the machine.

Kinematic pairs are divided into several types depending on the following characteristics:

1. The nature of kinematic elements.

ISSN NO: 2770-4491
Date of Publication:28-05-2022

2. The relative motion of the joints.

3. The number of connection conditions imposed on the movement of the joints.

The point at which two joints come together to form a kinematic pair is called a kinematic element.

Depending on the shape of the element, the kinematic pairs are divided into lower and upper pairs.

If one joint forms a kinematic pair with another joint through a point or a straight line, that pair is called a "High Pair". If one joint forms a kinematic pair with another joint through a surface or plane, that pair is called a "bottom pair." Depending on the relative motion of the joints, the kinematic pairs are flat and will be spatial.

If the shape of the kinematic element and the nature of the joints when a plane forms a relative motion, this pair is called a “flat kinematic pair”.

If the shape of the kinematic element and the nature of the joints such a pair is called a "spatial kinematic pair" if it exhibits spatial motion.

Kinematic pairs are divided into 5 classes, depending on the number of constraints on the relative motion of the elements that make up the kinematic pairs, ie the condition of the bonds. It is known that the number of degrees of freedom when a free body moves in space is ni body x, u, z three axes along the coordinate axes and these axes moves around in threes. Then its degree of freedom is N = 6 and the conditions of connection are S = 0. If we connect a sphere with a plane, it can move in 5 rounds, forming a pair of kinematics, that is, its number of degrees of gravity is N = 5:

$$S = 6 – N = 6 – 5 = 1$$

In the spherical plane, there are 3 rotations around the X, Y, Z axes and two advances with respect to the X, Y axes (Figure 3 b). Therefore, the number of conditions for the relative motion of the sphere in the plane is S = 1. So such a kinematic pair is a class I kinematic pair.

An Assyrian group is a kinematic chain in which the degree of motion must be zero when connecting its empty kinematic pairs with fixed joints. The division of kinematic chains into such groups was made in 1904 by prof. Invited by L.Assur. In order to have Assyrian groups, the kinematic pairs in the chain must belong to the lower, fifth class, and if there are high kinematic pairs in the chain, they must be replaced by the lower ones. The formation of structural groups of Assyria stems from the formula of P. Shebishev:

W = 3n - 2P5 = 0 where: R5 = 3 / 2n;

So the number of joints is n = 2, 4, 6, and so on. The number of kinematic pairs (respectively) P5 = 3, 6, 9, and so on should be equal to.

Number of joints, n 2 4 6

Number of kinematic pairs, P5 3 6 9

Assyrian group class II III IV and x.

Determining the reaction forces in the kinematic pairs of a mechanism is a matter of kinetostatic calculation. In determining the reaction birds, the birds that affect the mechanism are taken into account, including the birds of inertia. The kinetostatic calculation is based on the Dalamber method and the separation principle. Based on this, you can leave some connections and put the appropriate reaction birds on them while keeping the system still or moving.

In order to find the reaction forces in the kinematic pairs of the mechanism, it is necessary to divide the mechanism into Assyrian groups. The calculation of mechanisms under the influence of birds is the opposite of the order of kinematic calculations, starting with the Assyrian group, which joins the mechanisms at the end.

The mechanism consists of a set of kinematic chains, in which if one or more joints move, the remaining joints move according to a certain pattern.

The joint where the force (or moment) is applied to move the mechanism is called the lead (or head) joint. In the study of mechanisms, the law of motion of the head joint is given. All other joints in the mechanism are called lead joints. The law of motion of the leading joints is, of course, determined by the law of motion of the main joint. The joint that performs the desired action is called the working joint. 75% of the mechanisms used in practice belong to flat mechanisms.

The degree of mobility (freedom) of a mechanism means that in order to activate all the leading links in it, the mechanism must move to nine joints, or there are nine leading joints.

ISSN NO: 2770-4491
Date of Publication:28-05-2022

If the degree of freedom of the mechanism is equal to W = 1, it has one leading link, and if the degree of freedom is equal to W = 3, it has one leading link of the mechanism. When determining the mobility of a mechanism, the number of passive joints in it must be taken into account.

In order to study and classify the mechanisms used in various machines, tools and equipment, we turn to practice, mainly on the basis of their kinematic and design properties and, in some cases, their performance functions.

CONCLUSION AND DISCUSSION:

Any machine can do some useful work. That's why a car should have the following basic features in order to do useful work:

1. The machine is designed in a certain order;
2. Its parts move in a certain order;
3. The machine must perform appropriate useful mechanical work.

If there are only two of these signs in the car, and there are no other signs, then the car becomes a mechanism. This means that the mechanism does not do useful work and does not convert energy from one type to another. The function of a mechanism is to move or transmit motion in a specific order.

REFERENCES:

1. Toxirov A'zamjon. (2022). ROBOTOTEXNIKA MAJMUALARINING AVTOMATLASHTIRILGAN ELEKTR YURITMALARINI QO'LLANILISH SOHALARI. *Involta Scientific Journal*, *1*(6), 3–9.
2. URL: https://involta.uz/index.php/iv/article/view/159
3. DOI - 10.5281/zenodo.6519792
4. Djurayev A.D., Tokhirov A.I., Marasulov I.R. CLEANING COTTON FROM SMALL DIRTY // Universum: технические науки : электрон. научн. журн. 2022. 3(96).
5. URL: https://7universum.com/ru/tech/archive/item/13196
6. DOI - 10.32743/UniTech.2022.96.3.13196
7. Tokhirov A.I. Writing control programs for computer numeral control machines // Universum: технические науки : электрон. научн. журн. 2021. 5(86).
8. URL: https://7universum.com/ru/tech/archive/item/11810
9. DOI - 10.32743/UniTech.2021.86.5.11810
10. Tokhirov A.I. Application procedure CAD/CAM/CAE - systems in scientific research // Universum: технические науки : электрон. научн. журн. 2021. 6(87).
11. URL: https://7universum.com/ru/tech/archive/item/11836
12. DOI - 10.32743/UniTech.2021.87.6.11836
13. Tokhirov A.I. Using the graphical editor "Компас 3D" in teaching computer engineering graphics // Universum: технические науки : электрон. научн. журн. 2021. 7(88).
14. URL: https://7universum.com/ru/tech/archive/item/12076
15. DOI: 10.32743/UniTech.2021.78.8-3.12076
16. Tokhirov A.I., Marasulov I.R. CONTROL MODELS AND INFORMATION SYSTEM OF COTTON STORAGE IN THE CLASTER SYSTEM // Universum: технические науки : электрон. научн. журн. 2021. 11(92).
17. URL: https://7universum.com/ru/tech/archive/item/12486
18. Azamjon Ibrohim ugli Tokhirov, "TECHNOLOGICAL PROCESS DEVELOPMENT USING CAD-CAM PROGRAMS", "Science and Education" Scientific Journal, June 2021
19. URL: https://openscience.uz/index.php/sciedu/article/view/1561
20. Islombek Marasulov Ravshanbek Ogli, & Toxirov Azamjon Ibrohim Ogli. (2021). A ROLE OF MECHANICAL ENGINEERING IN MECHATRONICS.
21. *JournalNX - A Multidisciplinary Peer Reviewed Journal*, 824–828.
22. URL: https://repo.journalnx.com/index.php/nx/article/view/1690